

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-26 (**Cancelled**).

27. **(Original)** A method for identifying small molecules affected by an agent comprising:

obtaining a small molecule profile of said cellular compartment treated with an agent, and

comparing said small molecule profile to a standard small molecule profile;

thereby, identifying the compounds affected by said agent in said cellular compartment.

28. **(Original)** The method of claim 27, wherein said agent is a toxin.

29. **(Original)** The method of claim 27, wherein said agent is a therapeutic agent.

30. **(Original)** The method of claim 29, wherein said therapeutic agent is a therapeutic agent used for the treatment of a metabolic, immunological, neurological, oncological, viral, or other disorder.

31. **(Original)** The method of claim 27, wherein said cellular compartment is obtained from a patient.

32. **(Original)** The method of claim 31, wherein said patient is suffering from a metabolic, immunological, neurological, oncological, viral, or other disorder.

33. **(Original)** The method of claim 27, wherein said cellular compartment is a cells.

34. **(Original)** The method of claim 27, wherein said cellular compartment is mitochondria.

35. **(Original)** The method of claim 27, wherein said cellular compartment is a nucleus.

36. **(Original)** The method of claim 27, wherein said small molecule profiles are obtained using one or more of the following: HPLC, TLC, electrochemical analysis, mass spectroscopy, refractive index spectroscopy (RI), Ultra-Violet spectroscopy (UV), fluorescent analysis, radiochemical analysis, Near-InfraRed spectroscopy (Near-IR), Nuclear Magnetic Resonance spectroscopy (NMR), and Light Scattering analysis (LS).

Claims 37-55 **(Cancelled)**.

56. **(New)** A method for metabolomically monitoring a therapeutic agent, comprising:  
obtaining a small molecule profile from a subject being treated with a therapeutic agent; and  
monitoring changes in the small molecule profile of the subject.

57. **(New)** The method of claim 56, wherein said small molecule profile is compared to a standard profile.

58. **(New)** The method of claim 57, wherein said standard profile is from a healthy subject.

59. **(New)** The method of claim 57, wherein said standard profile is from a diseased subject.

60. **(New)** A method for monitoring the effectiveness of treatment of a subject with an agent, comprising:  
administering an agent to a subject;  
obtaining a post-administration sample from said subject;  
detecting a small molecule profile of the post-administration sample;  
comparing the small molecule profile of the post-administration sample with a standard profile; and  
altering the administration of the agent to the subject accordingly.

61. **(New)** The method of claim 60, wherein said agent is a therapeutic agent.

62. (New) The method of claim 60, wherein said agent is a peptidomimetic, protein, peptide, nucleic acid, or small molecule.

63. (New) The method of claim 60, wherein said standard profile is from a healthy subject.

64. (New) The method of claim 60, wherein said standard profile is from a diseased subject.

65. (New) The method of claim 60, wherein said standard profile is from the subject before administration of the agent.

66. (New) A method for predicting a subject's response to a therapeutic agent, comprising:  
obtaining a small molecule profile from a subject; and  
comparing the small molecule profile of the subject to a known standard established for the therapeutic agent as an indication of whether the subject would benefit from treatment with the therapeutic agent.

67. (New) A method for metabolomically monitoring the effectiveness of an therapeutic agent, comprising:  
obtaining a small molecule profile from a subject being treated with a therapeutic agent; and  
monitoring changes in the small molecule profile of the subject, thereby monitoring the effectiveness of a therapeutic agent.

68. (New) The method of claim 67, wherein said small molecule profile comprises therapeutic agent metabolites.

69. (New) The method of claim 67, wherein said small molecule profile comprises endogenous cellular metabolites.

70. (New) A method for identifying small molecules affected by an agent, comprising:  
obtaining a small molecule profile of a subject treated with an agent, and  
comparing said small molecule profile to a standard small molecule profile;

thereby, identifying compounds affected by said agent.

71. (New) The method of claim 70, wherein said agent is a therapeutic agent.
72. (New) The method of claim 70, wherein said agent is a peptidomimetic, protein, peptide, nucleic acid, or small molecule.
73. (New) The method of claim 70, wherein said agent is used for the treatment of a metabolic, immunological, neurological, oncological, viral, or other disorder.
74. (New) The method of claim 70, wherein at least one of the compounds affected by said agent is indicative of efficacy of said agent.
75. (New) The method of claim 70, wherein said small molecule profile is compared to a standard small molecule profile using a subtraction profile.
76. (New) The method of claim 70, further comprising administering to a subject a second agent, wherein said second agent is used for the treatment of the same disorder as said agent, and obtaining a second small molecule profile.
77. (New) The method of claim 76, wherein said second small molecule profile is compared to said small molecule profile to identify compounds affected by said agent and said second agent.
78. (New) The method of claim 70, wherein said identified compounds comprise agent metabolites.
79. (New) The method of claim 70, wherein said identified compounds comprise endogenous cellular metabolites.
80. (New) A method for identifying small molecules affected by a toxin, comprising:  
obtaining a small molecule profile of a subject treated with an toxin, and  
comparing said small molecule profile to a standard small molecule profile;  
thereby, identifying compounds affected by said toxin.

81. (New) The method of claim 80, wherein said compounds comprise endogenous cellular metabolites.

82. (New) The method of claim 80, wherein said compounds comprises toxin metabolites.

83. (New) A method of determining the toxicity of an agent, comprising:  
obtaining a small molecule profile of a subject treated with an agent;  
comparing said small molecule profile with a profile of one or more known toxins, thereby determining the toxicity of said agent.

84. (New) A method for reducing the side effects of an agent, comprising:  
obtaining a small molecule profile of a subject treated with an agent;  
comparing said small molecule profile with a profile of one or more known toxins;  
redesigning said agent to reduce amounts of small molecules associated with toxicity in said small molecule profile, thus reducing the side effects of said agent.

85. (New) The method of claim 84, wherein said small molecule profile comprises therapeutic agent metabolites.

86. (New) The method of claim 84, wherein said small molecule profile comprises endogenous cellular metabolites.

87. (New) A method for repositioning an agent, comprising:  
administering an agent to a subject;  
obtaining two or more small molecule profiles from at least two organs, tissues, cells, cellular compartments, organelles, or extracellular fluids; and  
determining which organs, tissues, cells, cellular compartments, organelles, or extracellular fluids are affected by said agent.

88. (New) The method of claim 87, wherein said small molecule profiles are obtained from a subject's heart, brain, kidney, liver, bone, blood, gastrointestinal tract, plasma, blood, sera, spinal fluid, brain fluid, saliva, urine, mucosal excretions, or muscle.

89. **(New)** The method of claim 87, wherein said agent is used for the treatment of a metabolic, immunological, neurological, oncological, viral, or other disorder.

90. **(New)** The method of claim 87, wherein said agent is a therapeutic agent.

**CLAIMS**

Claims 1-55 were pending. Claims 1-26 and 37-55 were cancelled. Claims 56-90 were added. No new matter has been added.

Support for new claim 56 can be found in the application as originally filed, for example, at least at page 39, line 23 through page 40, line 28. Support for new claims 57-59, 63, 64 can be found in the application as originally filed, for example, at least at page 15, line 9 through page 16, line 22. Support for new claims 60-62 and 64-65 can be found, for example, at least at page 40, lines 14-28. Support for new claims 70-77 can be found in the specification as originally filed, for example, at least at page 17, line 8-33. Support for claims 78, 79, 81, 82, 85 and 86 can be found in the specification as originally filed, for example, at least at page 70, lines 24-29 and page 74, lines 21-25. Support for claims 80, 83 and 84 can be found, for example, at least at page 17, line 8 through page 19, line 5. Support for claims 87-90 can be found, for example, at least at page 19, lines 6-23.